

HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.
CONSULTING ENGINEERS

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CLINT L. COURSON
DANIEL E. CHEEK, PE
K. MATTHEW CHEEK, PE

November 12, 2010

Mr. John E. Murray P.E.
Professional Engineer - Solid Waste Section
North Carolina Dept. of Env. & Natural Resources
Mooresville Regional Office
610 East Center Avenue, Suite 301
Mooresville, NC 28115

**Re: City of Albemarle Landfill
C&D Area Temporary Leachate Force Main
HHNT Project No. 1011-011-01**


Dear Mr. Murray:

We have enclosed the Construction Quality Assurance Report, prepared by Bunnell-Lammons Engineering, Inc. for the subject project, which includes the as-built survey of the force main.

Thank you for your assistance with this project. Should you have any questions, please call.

Sincerely,

HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.


R. Brant Lane, P.E.
Principal

RBL/jh

cc: Teresa Bradford (w/ enclosure)
Mike Lambert (w/ enclosure)
Nina Underwood (w/ enclosure)
Darren Preslar (w/ enclosure)
Dan Bunnell, P.E. (w/o enclosure)

November 8, 2010

Mr. Mike Lambert
City of Albemarle Public Works Department
P.O. Box 190
Albemarle, North Carolina 28002-0190

Subject: **Report of Construction Quality Assurance (CQA) Services**
 Leachate Force Main for C&D Landfill
 City of Albemarle Landfill
 Stanly County, North Carolina
 BLE Project No. J10-7013-01A (NC License C-1538)

Dear Mr. Lambert:

Bunnell-Lammons Engineering, Inc. (BLE) has completed Construction Quality Assurance (CQA) monitoring of the installation and pressure testing of a leachate force main for the leachate collection system of the C&D portion of the City of Albemarle Landfill. This CQA report provides a brief description of the installation and our CQA monitoring.

SUMMARY OF INSTALLATION:

A new leachate force main was installed at the existing C&D waste area between the leachate collection riser located near the toe of the east slope and the existing lined leachate storage pond (reference Figure 1). The pipe terminates next to the riser and makes a continuous run to discharge in the existing leachate pond. A quick-connect type fitting will connect the pump hose from the leachate collection riser to the force main. The installation was designed by Hodges, Harbin, Newberry and Tribble, Inc. and installed by J.T. Russell and Sons, Inc.

The 2-inch diameter, SDR 17 HDPE pipe force main is a total of approximately 900 feet long. The pipe was delivered in two 500-foot long coils. A single pipe connection made by a butt-fusion weld formed the completed pipe run. The pipe was laid in a 3-foot deep trench and backfilled with a 12-inch layer of compacted clean soil backfill, followed by soil containing some weathered rock to the surface. After the majority of the force main trench was backfilled, the pipe was successfully hydrostatically pressure tested to 95 psi for one hour.



*Report of CQA Services
Leachate Force Main for C&D Landfill
City of Albemarle Landfill
Stanly County, North Carolina*

*November 8, 2010
BLE Project No. J10-7013-01A*

A BLE technician performed full time CQA monitoring of the installation of the force main. Records of daily observations and photographs of the construction sequence are attached. An as-built survey of the force main prepared by Lawrence Associates is also attached.


The proposed leachate collection and cut-off trench was not constructed at this time. Construction of the force main was in accordance with the design plan and acceptable construction practices and standards.

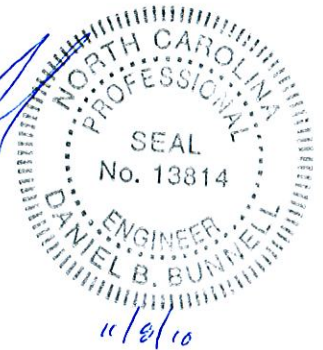
We appreciate the opportunity to be of assistance to the City of Albemarle and to provide the required services for this project. If you have any questions regarding this report, please do not hesitate to contact us at (864) 288-1265.

Sincerely,

BUNNELL-LAMMONS ENGINEERING, INC.

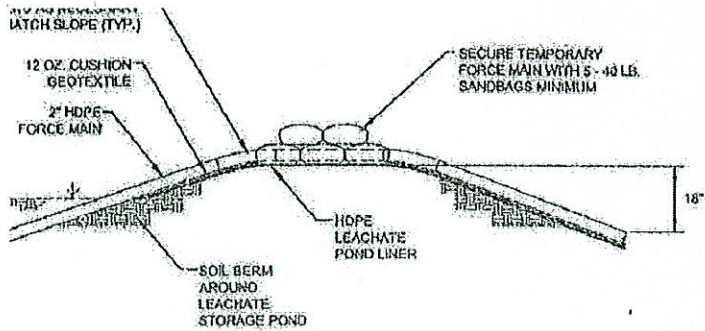

Gary L. Weekley, P.E.
Senior Engineer
Registered, NC 8251


Daniel B. Bunnell, P.E.
Principal Engineer
Registered, NC 13814

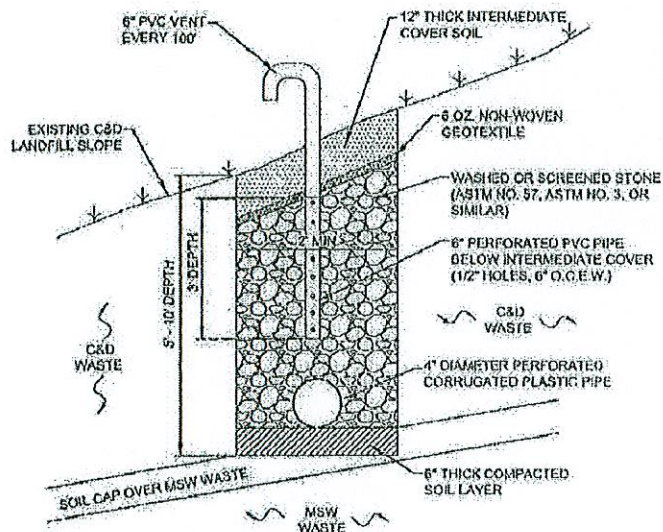


Attachments: Leachate Collection System (Figure 1)
Records of Daily Observations
Photographs
As-built Survey

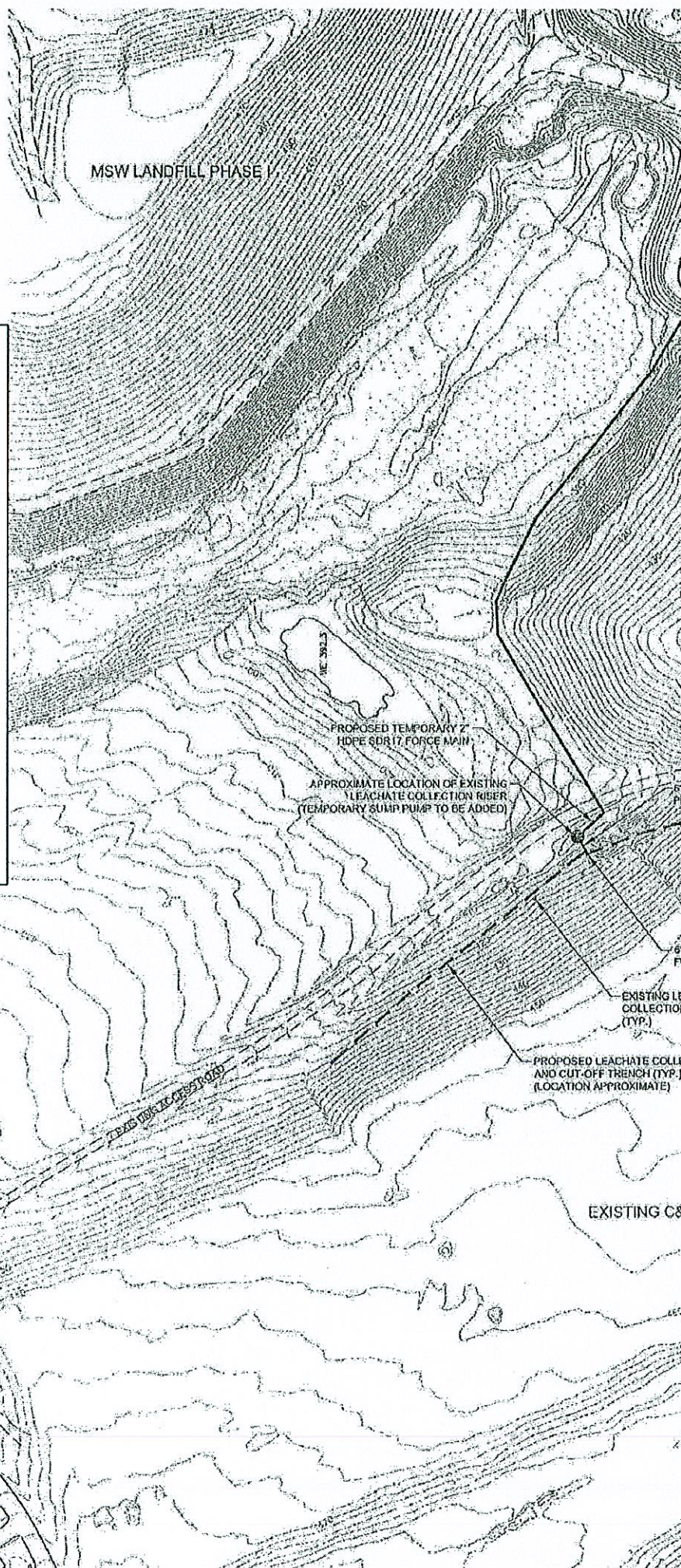
Copy: Mr. R. Brant Lane, P.E.
Hodges, Harbin, Newberry & Tribble, Inc.



TEMPORARY FORCE MAIN TERMINATION
NOT TO SCALE



LEACHATE COLLECTION AND CUT-OFF TRENCH
NOT TO SCALE
NOT INSTALLED



RECORD OF DAILY OBSERVATIONS

STORM DRAIN REMOVAL, RAINFLAPS, AND LEACHATE COLLECTION MODIFICATIONS

CITY OF ALBEMARLE LANDFILL
STANLY COUNTY, NORTH CAROLINA
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J10-7013-01A

CLIENT: CITY OF ALBEMARLE, NC

DATE: 10.20.10

PROJECT DAY NO. 12

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 3:30 PM

LUNCH BREAK: 1.5

WORK HOURS: 7

ONSITE BLE PERSONNEL: BROOKS CARLISLE

VISITORS:

NAME REPRESENTING

WEATHER: SUNNY ☒ RAIN
PTLY CLOUDY WINDY
☒ CLOUDY

TEMPERATURE:
MORNING LOW: 50° F
DAYTIME HIGH: 70° F

EQUIPMENT:

SITE ACTIVITIES

EXCAVATION FOR STORM DRAIN

RAINFLAP

LEACHATE MODIFICATIONS

CONTRACTOR ACTIVITIES:

Contractor STARTED EXCAVATING TRENCH FOR
2 INCH FORCEMAIN PIPE. Contractor WAS RAINED OUT
FOR 1.5 hrs. Contractor CAME BACK TO SITE AND
CONTINUED WORK ON TRENCH.

TECHNICIAN ACTIVITIES:

OBSERVED EXCAVATION OF TRENCH FOR 2"
FORCEMAIN. TRENCH WAS EXCAVATED DOWN 3 FEET.
I DROVE TWO TUBES IN CLAY @ STORM DRAIN
PIPE. Put SAMPLES IN BAGS FOR perm. test
TRAVELED TO CHARLOTTE & DROPPED SAMPLES OFF WITH
ELLEN JOY FROM BIE.

RECORD PREPARED BY:

Brooks Carlisle
Signature

BROOKS CARLISLE

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell
Signature

DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

STORM DRAIN REMOVAL, RAINFLAPS, AND LEACHATE COLLECTION MODIFICATIONS

CITY OF ALBEMARLE LANDFILL
STANLY COUNTY, NORTH CAROLINA
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J10-7013-01A

CLIENT: CITY OF ALBEMARLE, NC

DATE: 10.21.10

PROJECT DAY NO. 13

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 4:30 PM

LUNCH BREAK: .5

WORK HOURS: 9

ONSITE BLE PERSONNEL: BROOKS CARLISLE

VISITORS:

NAME

REPRESENTING

WEATHER:

SUNNY

RAIN

FTLY CLOUDY

WINDY

CLOUDY

TEMPERATURE:

MORNING LOW: 54° F

DAYTIME HIGH: 72° F

EQUIPMENT:

SITE ACTIVITIES

EXCAVATION FOR STORM DRAIN

RAINFLAP

LEACHATE MODIFICATIONS

CONTRACTOR ACTIVITIES:

Contractor Continued EXCAVATION TRENCH FOR
2" FORCEMAIN. Put protective COVER BACK ON TOP OF
LINER REPAIRS THAT CHEESAPEKE MADE ON LINER @ STORM
DRAIN PIPE.

TECHNICIAN ACTIVITIES:

OBSERVED THE EXCAVATION OF TRENCH FOR
2" FORCEMAIN PIPE. OBSERVED REPAIRS ON
RAIN FLAPS FOR STORM DRAIN CHANNELS. OBSERVED
REPAIRS ON GCL, HAPE, GDM @ STORM DRAIN PIPE.

RECORD PREPARED BY:

Signature

BROOKS CARLISLE

RECORD REVIEWED & APPROVED BY:

Signature

DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

STORM DRAIN REMOVAL, RAINFLAPS, AND LEACHATE COLLECTION MODIFICATIONS

CITY OF ALBEMARLE LANDFILL
STANLY COUNTY, NORTH CAROLINA
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J10-7013-01A

CLIENT: CITY OF ALBEMARLE, NC

DATE: 10.22.10

PROJECT DAY NO. 14

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 6:10 PM

LUNCH BREAK: .5

WORK HOURS: 10.5

ONSITE BLE PERSONNEL: BROOKS CARLISLE

VISITORS:

NAME

REPRESENTING

WEATHER:

SUNNY

RAIN

PTLY CLOUDY

WINDY

CLOUDY

TEMPERATURE:

MORNING LOW: 48° F

DAYTIME HIGH: 72° F

EQUIPMENT:

SITE ACTIVITIES

EXCAVATION FOR STORM DRAIN

RAINFLAP

LEACHATE MODIFICATIONS

CONTRACTOR ACTIVITIES:

Contractor Continued EXCAVATION OF TRENCH
FOR 2" FORCEMAIN, TRENCH WAS EXCAVATED 3' DOWN. Contractor
TRENCHED TO ROAD @ EDGE. PIPE WAS PLACED IN TRENCH.
Contractor started BACK FILL OF TRENCH. BOTTOM 12" + CLEAN
FILL AND ROLLED IN WITH ROLLER BUCKET. REMAINING TRENCH
FILL WITH ROCKY SOIL.

TECHNICIAN ACTIVITIES:

TECHNICIAN JOINED CONFERENCE CALL W/ BRANT LANE, MIKE
LAMBERT, NATHAN RUSSEL, DAN BUNNELL, GARY WEEKLEY, DISCUSSED
SCOPE OF WORK FOR FORCEMAIN. OBSERVED TRENCH EXCAVATION.
OBSERVED BACKFILL OF TRENCH. PERFORMED HAND AUGER BORING
@ STORM DRAIN PIPE FOR MEASUREMENT OF DEPTH OF PROTECTIVE
COVER. PROTECTIVE COVER IS 42" THICK.

RECORD PREPARED BY:

Signature

BROOKS CARLISLE

RECORD REVIEWED & APPROVED BY:

Signature

DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

STORM DRAIN REMOVAL, RAINFLAPS, AND LEACHATE COLLECTION MODIFICATIONS

CITY OF ALBEMARLE LANDFILL
STANLY COUNTY, NORTH CAROLINA
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J10-7013-01A

CLIENT: CITY OF ALBEMARLE, NC

DATE: 10.25.10

PROJECT DAY NO. 15

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 2:00 PM

LUNCH BREAK: .5

WORK HOURS: 6

ONSITE BLE PERSONNEL: BROOKS CARLISLE

VISITORS:

NAME REPRESENTING

WEATHER: SUNNY ~~RAIN~~
PTLY CLOUDY WINDY
~~CLOUDY~~

TEMPERATURE:

MORNING LOW: 62° F

DAYTIME HIGH: 71° F

EQUIPMENT:

SITE ACTIVITIES

EXCAVATION FOR STORM DRAIN

RAINFLAP

LEACHATE MODIFICATIONS

CONTRACTOR ACTIVITIES:

Contractor FINISHED COVERING THE
TRENCH FOR 2" FORCEMAIN. TRENCH EXTENDS FROM
POND TO EASTERN EDGE OF ROAD. EXCESS 2-INCH
PIPE COILED IN A ROLL AT EDGE OF ROAD.

J.T. RUSSELL ALSO PREPARING TO PERFORM
HYDROSTATIC PRESSURE TEST ON 2 INCH LINE.

TECHNICIAN ACTIVITIES:

OBSERVED Contractor FINISHING THE
COVERING OF 2" FORCEMAIN.

RECORD PREPARED BY:

Signature

BROOKS CARLISLE

RECORD REVIEWED & APPROVED BY:

Signature

DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

STORM DRAIN REMOVAL, RAINFLAPS, AND LEACHATE COLLECTION MODIFICATIONS

CITY OF ALBEMARLE LANDFILL
STANLY COUNTY, NORTH CAROLINA
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J10-7013-01A

CLIENT: CITY OF ALBEMARLE, NC

DATE: 10.26.10

PROJECT DAY NO. 16

ARRIVAL TIME: 8:00 AM

DEPARTURE TIME: 3:00 PM

LUNCH BREAK: .5

WORK HOURS: 6.5

ONSITE BLE PERSONNEL: BROOKS CARLISLE

VISITORS:

NAME REPRESENTING

WEATHER: SUNNY ~~RAIN~~

PTLY CLOUDY WINDY

~~CLOUDY~~

TEMPERATURE:

MORNING LOW: 65° F

DAYTIME HIGH: 76° F

EQUIPMENT:

SITE ACTIVITIES

EXCAVATION FOR STORM DRAIN

RAINFLAP

LEACHATE MODIFICATIONS

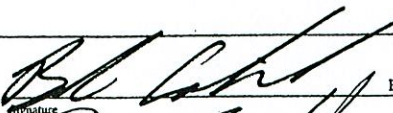
CONTRACTOR ACTIVITIES:

Contractor PERFORMED PRESSURE TEST ON 2"
HDE FORCE MAIN. PRESSURIZED PIPE @ 100 PSI. PRESSURE
dropped down to 95 PSI within 10 min. Held @ 95 PSI
for 1 hr 15 min.

TECHNICIAN ACTIVITIES:

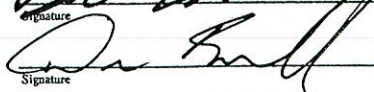
OBSERVED PRESSURE TEST ON 2" FORCE MAIN. PRESSURIZED
@ 100 PSI. Pressure dropped to 95 PSI and Held
for 1 hr 15 min.

RECORD PREPARED BY:



BROOKS CARLISLE

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

STORM DRAIN REMOVAL, RAINFLAPS, AND LEACHATE COLLECTION MODIFICATIONS

CITY OF ALBEMARLE LANDFILL
STANLY COUNTY, NORTH CAROLINA
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J10-7013-01A

CLIENT: CITY OF ALBEMARLE, NC

DATE: 10.29.10

PROJECT DAY NO.

18

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 3:00 PM

LUNCH BREAK: 1.5

WORK HOURS: 7.5

VISITORS:

NAME

REPRESENTING

ONSITE BLE PERSONNEL: BROOKS CARLISLE

WEATHER:

SUNNY

RAIN

PTLY CLOUDY WINDY

CLOUDY

TEMPERATURE:

MORNING LOW: 54° °F

DAYTIME HIGH: 79° °F

EQUIPMENT:

SITE ACTIVITIES

EXCAVATION FOR STORM DRAIN

RAINFLAP

LEACHATE MODIFICATIONS

CONTRACTOR ACTIVITIES:

Contractor RAN 2" FOREMAIN ACROSS Rd. TO EDGE
OF RISER. BACKFILLED TRENCH. Put GEOTEXTILE MATERIAL
ON top of 3" STONE 2' BELOW SURFACE, COVERED UP
WITH 2' OF SOIL. AROUND RISER

TECHNICIAN ACTIVITIES:

OBSERVED 2" FOREMAIN EXTENDED ACROSS Rd. AND
TRENCH BEING BACKFILLED. OBSERVED PLACEMENT OF GEOTEXTILE
MATERIAL ON TOP OF 3" STONE @ RISER. GEOTEXTILE EXTENDED
3' AROUND RISER. OBSERVED BACK FILL OF ~~DIRT~~ REMAINING 2FT WITH
SOIL.

RECORD PREPARED BY:

Signature

BROOKS CARLISLE

RECORD REVIEWED & APPROVED BY:

Signature

DANIEL B. BUNNELL, P.E.



Photograph 1: Open trench, 3 feet deep with 2-inch diameter SDR-17 HDPE pipe for force main.



Photograph 2: Backfilling force main trench with soil.



Photograph 3: Coiled extra force main pipe near leachate riser. Photo taken before quick connection to pump hose.



Photograph 4: Force main outfall into lined leachate pond.